Applying an equity lens to hospital safety monitoring: a critical interpretive synthesis protocol

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ABSTRACT

Introduction  Hospital safety monitoring systems are foundational to how adverse events are identified and addressed. They are well positioned to bring equity-related safety issues to the forefront for action. However, there is uncertainty about how they have been, and can be, used to achieve this goal. We will undertake a critical interpretive synthesis (CIS) to examine how equity is integrated into hospital safety monitoring systems.

Methods and analysis  This review will follow CIS principles. Our initial compass question is: How is equity integrated into safety monitoring systems? We will begin with a structured search strategy of hospital safety monitoring systems in CINAHL, EMBASE, MEDLINE and PsycINFO for up to May 2023 to identify papers on safety monitoring systems generally and those linked to equity (eg, racism, social determinants of health). We will also review reference lists of selected papers, contact experts and draw on team expertise. For subsequent literature searching stages, we will use team expertise and expert contacts to purposively search the social science, humanities and health services research literature to support the development of a theoretical understanding of our topic. Following data extraction, we will use interpretive processes to develop themes and a critique of the literature. The above processes of question formulation, article search and selection, data extraction, and critique and synthesis will be iterative and interactive with the goal to develop a theoretical understanding of equity in hospital monitoring systems that will have practice-based implications.

Ethics and dissemination  This review does not require ethical approval because we are reviewing published literature. We aim to publish findings in a peer-reviewed journal and present at conferences.

INTRODUCTION

Hospital safety monitoring systems, such as safety incident reports, patient complaints, morbidity and mortality conferences and chart reviews, form the cornerstone of how hospitals identify and address adverse events. These systems are therefore well positioned to bring equity-related safety issues to the forefront for attention and action. However, there is uncertainty about how they have been, and can be, used to achieve this goal. Equity is one of the six core dimensions of quality, yet it has largely been ignored in healthcare quality improvement (QI). Equity is defined as the ‘absence of unfair, avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically or geographically or by other dimensions of inequality (eg, sex, gender, ethnicity, disability, or sexual orientation). Efforts aimed at attending to equity-related safety issues in hospitals require more than adding an equity question or field to existing safety monitoring systems given that the systems themselves are in need of attention and change. The advancement of equity in hospital patient safety requires an in-depth and systematic critical analysis and interpretation of literature about both hospital safety monitoring systems and equity, and their intersections, to inform the transformative change needed to meaningfully address equity-related safety concerns.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The review method draws on multiple fields of literature to allow for a deeper understanding of the phenomenon of equity and hospital safety monitoring systems.
⇒ Critical interpretive synthesis (CIS) builds on traditions of qualitative research inquiry and is characterised by an iterative, interactive and dynamic approach.
⇒ This review offers a critical interpretation of the evidence to provide new insights into equity and hospital safety monitoring systems that could not be captured through only a thematic summary.
⇒ There are reproducibility challenges to CIS given its interpretive nature; however, a CIS is grounded in the evidence and a multidisciplinary research team ensures that analysis is not limited to one perspective.
Research linking equity to patient safety in hospitals is accumulating.15-21 Studies report on the existence of racial and/or ethnic and socioeconomic disparities in rates of adverse events, including hospital acquired infections, adverse drug events and dosing errors.15 16 In a study of racial differences in surgical outcomes among apparently healthy children, being African American was strongly associated with postoperative complications and mortality compared to white children.17 Studies of Indigenous peoples and black women’s experiences of healthcare described quality of care problems such as type of care and treatment options offered, delays in diagnosis of a health problem and serious neglect.16 19 Among home care recipients admitted to hospital, patients who received language-concordant physician care experienced fewer adverse events, had shorter hospital stays and were less likely to die in hospital when compared with their counterparts who received language-discordant care.20 These findings demonstrate the ways in which unsafe healthcare due to factors such as provider bias and discrimination and systemic racism compound already existing inequities in health outcomes.15 17-19 Clearly race, ethnicity, socioeconomic, Indigeneity and language concordance play a role in patient safety and require attention in hospital safety monitoring systems.

There are multiples types of hospital safety monitoring systems,1 characterised by different methods for detecting safety events (see box 1). The methods vary in the timing of reporting (retrospective vs prospective), whether they are provider or patient-oriented (eg, incident reporting vs patient complaints), frequency of data collection and professional groups involved.1 22 A study that examined five reporting systems—incident reporting, reports to hospital risk management, patient complaints, executive walk rounds and malpractice claims—explained how each collected different information and provided unique and overlapping views on the range of patient safety problems in a hospital.23 For example, communication-related safety concerns appeared in the malpractice claims and the patient complaints data, but not in the hospital’s risk management data. Furthermore, the contributions of reports by provider group varied by system; for instance, nurses reported incidents in the reporting system more than physicians. As such, a comprehensive picture of safety requires the synthesis of information across a range of systems. More recent studies highlight the value of integrating data at the patient level.2 24 For example, de Vos and colleagues examined the relationship between data collected from three independent reporting systems, incidents, adverse events and complaints, but for the same admissions.24 While each system collected different details from the same patient journey, analysis of patient-level connections revealed noteworthy patterns. For instance, patients with incidents more commonly had adverse events and adverse event cascades (one event triggering a cascade of events) than patients without incidents. Building on the above findings, a focus on equity in hospital safety monitoring systems requires examination of the ways that equity is being addressed, or not, in the context of each system, and a recognition that systems might support or hinder the collection of equity insights in different ways. Furthermore, it is important to attend to how combining data from different viewpoints, and at the patient level, can optimise insights.

While hospital safety monitoring systems provide a promising platform for bringing attention to inequities, they suffer from well-acknowledged limitations that need to be addressed if they are to be helpful in reducing health disparities.12-14 24 25 For instance, concerns have been raised that incident reports are overloaded with events (eg, routine medication errors, falls) unlikely to generate novel insights into latent threats, the majority of reported incidents never undergo investigations, and superficial recommendations are made with limited follow-up on the implementation of interventions.12-14 25 The dominant focus in safety monitoring systems such as incident reporting has been building the technical infrastructure for collecting and analysing incident reports, with insufficient attention to the broader inquiry and action needed for learning and improvement.15 In relation to patient complaints, there are concerns that they are handled as isolated issues between patients and providers and separate from QI practices; the complexity of patient stories is not captured; and there are difficulties identifying the improvement strategy and target group related to a given complaint.24 Future efforts that include an equity lens could allow for a reorientation to learning and system-wide improvements.

In addition to the problems with hospital safety monitoring systems already noted in the literature, recent research is showing that they may not capture critical details about equity (eg, race/ethnicity, religion, sex, gender, income, financial barriers, disability21 26-28) that would make explicit the ways that equity-related factors influence safety practices and events. For instance, studies have reported race differences in adverse event occurrence by type and hospital setting2 and that voluntary incident reporting systems may underdetect safety issues

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**Box 1 Hospital-based safety monitoring systems**

-⇒ Failure mode and effect analysis
-⇒ Direct observation
-⇒ Voluntary incident reporting
-⇒ Chart review
-⇒ Administrative datasets
-⇒ Mortality reviews
-⇒ Patient complaints
-⇒ Patient interviews
-⇒ Automated triggers
-⇒ Reports to risk management
-⇒ Autopsies
-⇒ Morbidity and mortality conferences
-⇒ Malpractice claims filed against hospital and staff
-⇒ Data warehouses
-⇒ Executive walk rounds

in marginalised populations. A study among hospitalised children comparing voluntary event reporting to the Global Assessment of Paediatric Patient Safety trigger tool found no disparities by weight category or race, although the authors noted that voluntary event reporting may systematically under-report adverse events in hospitalised children with limited English proficiency. The variability in reporting may be due to implicit bias in providers and/or structural bias embedded in safety monitoring systems. Given hospital monitoring systems shape how safety priorities get defined and resourced, limitations in data capture may risk perpetuating systemic health inequities.

Existing hospital monitoring systems therefore need major reforms or new approaches are needed if original systems are not set up to respond to the complexity of equity-related safety concerns. Recommendations have been made about how to improve hospital safety monitoring systems. These include, for example, widening the analysis from a specific incident to the ‘patient journey’; working with patients and families to identify, define and prioritise safety issues; conducting fewer but deeper and more proportionate analyses; and treating recommendations as improvement projects. The pursuit of these recommendations needs to occur with attention to addressing equity as one of the six dimensions of quality. Initial suggestions in this area include collecting patient perceptions of racial/ethnic bias and patient safety through existing healthcare surveys and requiring healthcare facilities to collect patient race/ethnicity information as part of their safety improvement efforts. However, further research, including examining equity-related issues in relation to and across hospital monitoring systems and studies of the implementation of these recommendations, is needed.

An examination of equity in hospital safety monitoring systems cannot focus exclusively on hospital safety literature. Instead, it needs to incorporate knowledge and evidence from a variety of disciplines, including the social sciences and humanities and health services research fields. Social science and humanities literature provides the critical frameworks required to: (1) examine the epistemologies and structures of power that underpin hospital safety monitoring systems allowing us to question assumptions and practices; (2) centre, for example, understandings of coloniality, structural racism, gender and sexuality and (3) deliberate about the use of racial and ethnic categories in health. These lenses support a shift from an institutional focus of patient safety towards person-centred care where the needs and wants of patients are at the core. Health services research on the social determinants of health and racism provides essential background and guidance for examining hospital-based equity-related patient safety practices. The reported patterns for antiracism interventions to overemphasise individual-level training and underemphasise organisational and policy-level changes highlight the need for equity in hospital reporting systems to be characterised by a multilevel approach.

An understanding of current practices regarding hospital safety monitoring systems, and a critical examination of these practices with attention to related fields of knowledge, will set a necessary foundation for the design and implementation of equitable safety monitoring systems.

Review objective
Our objective is to develop an interpretive theoretically informed understanding of equity in hospital safety monitoring systems.

METHODS AND ANALYSIS
We will use a critical interpretive synthesis (CIS) literature review method. In contrast to conventional systematic reviews that aim to aggregate and summarise data about predefined concepts, a CIS aims to critically examine the literature and, using processes of induction and interpretation, develop a theoretical understanding grounded in the studies in the review. Processes of question formulation, searching, selection, data extraction, critique and synthesis are iterative and interactive. Therefore, in a CIS, there is an initial broad review question, referred to as the ‘compass question’, which becomes further defined over time based on search results and analysis of the literature. Our initial compass question is: How is equity integrated into safety monitoring systems? A CIS allows for relevant literature from multiple fields with varied methodological and epistemological traditions to be incorporated into the review, and requires a critical orientation to the material examined and emerging theoretical ideas. We plan for this CIS to be completed by June 2024.

Search strategy
Our search of the literature will involve a range of strategies. We will begin with a structured search strategy of hospital safety monitoring systems. The safety monitoring systems included in this review, listed in box 1, are informed by the Agency for Healthcare Research and Quality ‘Detection of Safety Hazards’ Primer and hospital safety literature. We will restrict the literature review to studies based in hospital settings. As one part of a health system, hospitals provide ‘continuous availability of services for acute and complex conditions. They concentrate scarce resources within well-planned referral networks to respond efficiently to population health needs’. There will be no restrictions on study design, we will include commentaries, primary research, reviews and reports. The search will be structured to include both papers on safety monitoring systems generally and those linked to equity considerations (eg, health disparity, racism, minority groups, social determinants of health, social discrimination). Similar search strings for the period up until May 2023 will be performed across databases (CINAHL, EMBASE, MEDLINE and PsycINFO) with minor adjustments to ensure optimisation (see...
online supplemental file 1 for search strings). We will complement this search strategy of the published literature with reviewing reference lists of selected papers, contacting experts and drawing on the research team’s expertise. In addition, we will draw on the research team to identify examples of grey literature, such as frameworks or policies about equity in safety monitoring systems, that could inform our review. We will update the structured search if the review is not completed within a year of the original search.

For subsequent literature searching stages, we will draw on expertise within the team and contacts with experts to purposively search the social science and humanities and health services research literature to support the development of conceptual and theoretical understandings of our topic of interest. For instance, literature about intersectionality, structural discrimination and epistemic injustice from the social sciences and humanities, and documents such as The Canadian Institutes of Health Research – Institute of Health Services and Policy Research’s Strategic Plan 2021–2026: Accelerate Health Care System Transformation through Research to Achieve the Quadruple Aim and Health Equity for All will provide important and relevant lenses to analyse and interpret hospital safety monitoring research including underlying paradigms.

**Study selection**

The broad search strategy of CIS can result in a very large number of records. In contrast to a conventional systematic review methodology which requires the inclusion of all relevant literature, a CIS involves identifying potentially relevant papers to provide a sampling frame, given that the focus is to develop concepts and theory rather than an exhaustive summary of all data. A group of five research team members (JG, LL, PT, LR and BW) will review an initial random sample of 20 abstracts and discuss decisions about inclusion and exclusion based on the criteria (table 1). Any required clarifications to the criteria will be made following this initial group assessment. Two research team members (JG and LL) will then screen all of the abstracts independently, ensuring that each abstract is reviewed by multiple team members. They will classify each abstract as ‘include’, ‘exclude’ or ‘uncertain’. They will discuss uncertainties and discrepancies between them and consult with other research team members (PT, LR and BW) regarding unresolved discrepancies. We will make any further needed revisions to inclusion and exclusion criteria through discussions over time. Abstracts will be coded qualitatively and categorised (eg, type of reporting system, focus of paper, whether it includes references to equity); categories will then guide the sampling of publications for full-text retrieval, in consultation with the research team.

For the full-text papers retrieved, we will confirm that they meet the initial inclusion/exclusion criteria and then apply the five quality criteria used in the original and subsequent CIS reports (online supplemental file 2). Following these examples, we will only exclude papers with major methodological limitations. This approach reflects a premise of CIS that an assessment of a study should be weighted towards its relevance and ability to provide insight to the concepts created in the literature reviewed and a critique of this literature, rather than to methodological specificities. For instance, in their review of the roles of midwives in health systems, Mattison et al undertook a CIS on ‘high value articles’ that provided the most insights into the compass question, referring to those that were ‘conceptually rich or integrated different concepts, filled disciplinary gaps, captured a breadth of perspectives across different countries or applied approaches outside of health’. Based on the above criteria and premises, our research team will make judgements and interpretations of credibility and contribution of papers during processes of synthesis and interpretation. Principles of purposive and theoretical sampling and theoretical saturation will be employed in the selection of papers; this sampling will occur in conjunction with generation of conceptual and theoretical understandings. We will use Covidence to review abstracts and full-text copies of papers, extract and analyse data, and document decisions.

**Data extraction and interpretive synthesis**

Data analysis in CIS, similar to primary qualitative research analysis, is an iterative process involving detailed inspection of papers, identifying recurring themes and developing a critique. At least two research team members will

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| **Inclusion criteria** | ► Hospital setting (inpatient, emergency department and ambulatory)  
► About at least one hospital monitoring system  
► Any type of publication: review, commentary and empirical study |
| **Exclusion criteria** | ► Any clinical setting other than hospital  
► Research studies that generate new knowledge for why harms occur rather than on the use of a safety monitoring system to collect, synthesise, interpret and learn from these harms  
► Studies with the aim of identifying incidents of device-related or medication-related reports due to the device or medication itself, not to practice or system factors  
► Chart reviews that are not about monitoring for hospital safety  
► An intervention-based study that is aiming to improve safety in general and not a hospital monitoring system  
► Descriptive study of a clinical condition versus understanding adverse event via safety monitoring system  
► Reporting system outside of the hospital that does not include safety data collected from a hospital |

Box 2  Examples of guiding questions

⇒ How are safety and harm defined or conceptualised?
⇒ What topic is being examined in the context of the hospital monitoring system?
⇒ Is an equity perspective incorporated in the paper? How?
⇒ What are underlying epistemological assumptions of the study/paper?
⇒ What critical perspectives are offered about the hospital monitoring system?
⇒ Who is involved in collecting, analysing and interpreting information in the hospital monitoring system?
⇒ What theoretical or conceptual ideas are used in the paper?
⇒ What alternative ways of collecting and interpreting information about safety are being proposed?
⇒ What is being proposed versus being incorporated into practice?

be responsible for data extraction. We will read through each paper and adapt data extraction to the nature of the type of paper. For empirical study and review papers, we will extract data related to study purpose, research participants, methods of data collection and analysis and major findings. For commentary papers, we will extract major ideas. In addition, we have created an initial list of guiding questions that will support data extraction and the interpretive synthesis (box 2). Notes will be recorded for each paper, and additional questions will be added iteratively over the course of the review. Analysis will involve examination of the data extracted, identification of patterns, categories and themes and ongoing development of theoretical constructs. We will use a critical analytical lens, being attentive to the credibility of the evidence, contradictions in the papers, the research methodologies and discourses present and the proposed recommendations.46 As this synthesis and interpretation of the hospital monitoring systems literature occurs, we will purposively draw on the social science and humanities and health services literature to support this interpretive process. The goal of analysis will be a synthesising argument that integrates evidence from the studies into a theoretical understanding made up of a combination of constructs to provide a generalisable account of equity and hospital monitoring systems.46 The research team will engage with processes of reflexivity to inform the emerging theoretical concepts and guide the sampling of articles.

Review team

The multidisciplinary review team will optimise the range of perspectives informing the review. The team includes expertise in QI and patient safety, equity, healthcare services, sociology, organisational behaviour, human factors engineering, scoping and systematic reviews and qualitative and quantitative research methods. The team includes individuals with varied healthcare professional backgrounds (medicine, nursing, social work and recreational therapy), individuals at the front lines of providing healthcare and expected to partake in hospital safety monitoring systems, as well as individuals in leadership positions overseeing hospital safety monitoring systems. The team will meet regularly given the interpretive, dynamic and iterative nature of the review methodology.

Patient and public involvement

The review team will include at least three patients and/or family representatives. We are working with patient engagement programmes to recruit individuals with varied sociodemographic and geographical backgrounds and experiences with a hospital monitoring system (eg, patient complaint, incident report). We will have discussions with these individuals about how to include them in the CIS in a way that is meaningful to them and to the research goals. An initial plan is for these individuals to contribute their insights about the literature syntheses and interpretations over the course of the review, particularly in relation to the role of patients and families in hospital monitoring systems. These individuals will be financially compensated for their time according to national guidelines.56 57 We aim to be aware of both the opportunities and challenges of patient and public involvement in healthcare research58 59 and will engage in ongoing discussions and reflexivity to empower these individuals to contribute to this CIS.

ETHICS AND DISSEMINATION

This review does not require ethical approval because we are reviewing and synthesising data from already published literature. We aim for our dissemination activities to include but not be limited to publishing our findings in a peer-reviewed journal and presenting at scientific conferences.

Implications

The findings can be used to guide future research, policy and practice on how an equity lens could inform the evolution of hospital safety monitoring to overcome the limitations of current approaches and better address systemic inequities in healthcare. Our review fills a gap by summarising and critiquing the safety monitoring literature, through the use of social science, humanities and health services research literatures to deepen our theoretical understandings of how to incorporate equity into hospital safety monitoring systems. These conceptual and theoretical understandings will have practical implications for how to move forward with strengthening hospital safety monitoring systems.

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